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"So wide and varied": Brian Vickery and the nature of information science

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Abstract

The paper examines B.C. Vickery's contributions to the continuing debate on the nature of the information sciences, as academic disciplines and domains of professional practice, focusing on ten main topics: what is information science; information science as a field of study; the core of information science; information science and other disciplines; cognate information disciplines; information science: theory and practice; education for information science; the importance of the user; the place of knowledge organisation; and information science: looking backward and forward.

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Introduction

The purpose of this paper is to examine Brian Vickery's contributions to the continuing debate on the nature of the information sciences, as academic disciplines and domains of professional practice.

The analysis focuses on Vickery's developing ideas of the unique contributions of, and distinct 'academic territory' for, information science, with the organisation of information for retrieval, and the technology-invariant features of human information-related behaviour at its core. It also examines his constant vision - expressed in the title of his well-known textbook - that information science is both theory and practice, and the two are inter-twined and must learn from and reinforce each other. It is not a comprehensive analysis of his writings, still less of his influence; it is based on material published between 1970 and 2009, in readily available sources.

As has been pointed out by Robertson [1], Vickery's area of interest broadened throughout his career: from a focus on information representation, and classification in particular, to information retrieval generally, and thence to information science as a whole. Richmond [2, p. 247] thought "it is quite in order to call Vickery a Renaissance man", while Coates [3, p216] emphasises the developing breadth of his interests: "he has been outstanding as a great and fruitful 'connector' of the apparently disparate and partly formed ideas of others". Although all the quotations

in this paper are dated, this is not a study of the development of his thought, and the treatment is thematic rather than chronological.

The paper is based around ten main topics or issues:

- what is information science
- information science as a field of study
- the core of information science
- information science and other disciplines
- cognate information disciplines
- information science: theory and practice
- education for information science
- the importance of the user
- the place of knowledge organisation
- information science: looking backward and forward.

Extensive quotations from Vickery's work has been used as the basis for the presentation. Vickery generally expressed his views succinctly and with clarity, " very well organised and lucid", as Richmond [2, p245] puts it, and so far as possible he has been allowed to speak for himself.

1 What is information science?

At the heart of any understanding of 'information science' must surely be an understanding of 'information'. Vickery was clearly aware of the use of the 'information' concept in other subject areas, writing:

[There has been] a widening of the field covered by the concept of 'information', both its theory and its practice. Information transfer has been put on a par with the transfer of matter and energy, as one of the primary natural processes.

[4, p 7]

Yet he never seemed to wish to define 'information', perhaps feeling that, in context, its meaning is obvious. Even in his extensive textbook [5], information is taken simply as what is communicated between people. In one of his later writings, he suggests, as a response to an 'umbrella' definition, that "it might be helpful to define information as 'knowledge needed to carry out an action of any kind (practical or intellectual)' [6, p 245]. This pragmatic approach, avoiding a search for fundamental definitions or paradigms, typifies his approach.

As will be seen later, Vickery regarded the academic discipline of information science as having developed from a practical activity, with which it remained closely linked, together with the technology which supported it:

'Information science' emerges (a) when conceptual explorations, not directed towards immediate practical or technical ends, begin to take place, and (b) they are seen to be concerned with a definable area of interest [that of facilitating the transmission of information between people]

[7, p 220]

In its whole sweep, therefore, information work includes: science, that helps us to understand our problems; technology, that helps us to solve them; and the art of participating in each delicate interpersonal communication into which we are invited. The fusion of these three aspects of the craft creates a 'triple glow' of optimal service.

[7, p 330]

His consistent view that it amounted to the scientific study of communication between people in society. An early explanation cast this in terms of information systems:

The area of scientific interest is ... the study of the objectives, functions, structure, properties, behaviour, performance and effects of informative communication processes and information systems. To this study the name "information science" can legitimately be attached.

[7, p 330]

but it was more frequently expressed more generally:

Information science is identified as ... the study of the communication of information in society. This meaning is only beginning to emerge from its practical background, the social activity of facilitating information transfer.
[5, p 1]

The scientific study of the communication of information in society – 'information science' in the sense of an academic discipline...
[5, p 11]

This formulation was strongly criticised by Ingwersen [8] and others as exaggerated, and claiming too broad a scope for the discipline. However, with hindsight, it seems that Vickery was right to take a broad view, even if it had to later somewhat qualified, as noted below, for example to distinguish between information science and the study of mass communications. Webber [9] suggests that a holistic viewpoint, typified by Vickery's concept, is at the basis of the British approach to information science.

Aware that the field had developed in stages, from science information, then information technology and information systems, to this broader concept [5, p 11 and Appendix 2], he was keen to emphasise this broader view:

It is essential to stress that information science is not solely concerned with science information, nor indeed only with the provision of information to academic and professional workers, but with all forms of information transfer in society.
[5, p 11]

In this, he may be seen as an early advocate of studies of 'everyday life' information; see, for example, Savolainen [10] and Carey, McKechnie and McKenzie [11], at a time when most studies focused on professional and educational groupings [12]. Vickery's general approach has been followed by other commentators on the nature of information science, including Saracevic [13, 14] and Robinson [15].

Vickery was therefore able to give a brusque and pragmatic explanation of the purpose of the information science discipline:

The job of our profession is to facilitate the provision of knowledge (in all forms) to those who need it (for whatever purpose)
[6, p 246]

However, he proposed, and over the years returned, to a more nuanced explanation, based a three-fold distinction of the field's concerns:

Our profession is concerned with three "aspects of the world". First, how people behave when they feel a need for information; second characteristics

of documentary information that constrain how we can manipulate it; and third, characteristics of the physical media that carry the information, whether they be static books or dynamic electronic networks.
[16, p 27]

Information practice is concerned with facilitating the interaction between knowledge seekers – through channels – with knowledge (personal and recorded). Stepping back from practice, we may see the role of the science as exploring the characteristics of people and their 'information behaviour', the features of knowledge records of every kind, the variety of channels (oral, written, printed, graphic, digital) that may be used to transmit information, and how the three elements interact.
[17, p xxiii]

The terms are used more broadly than may be immediately apparent. For example, Vickery makes clear that 'documentary information' is studied by methods such as domain analysis and bibliometrics [16], while understanding knowledge records underlies cataloguing, indexing and abstracting [18].

Nor does Vickery wish to distinguish any particular aspect of this role as unique to information science; rather the distinguishing feature is a concern for the whole:

It is with this whole cycle [between generation and use of information] that information science is now concerned.
[5, p 9]

[The particular concern of the information scientist] is with the process as a whole – the interaction between the three elements [information behaviour, records, channels] that leads to people becoming informed.
[17, p xxiii]

This wide concern of information science for the whole of Vickery on one occasion referred to as the "chain of information transfer activities" [19, p 460], has been echoed by more recent authors, who have seen the uniqueness of information science as being a concern for all aspects of the communication chain; see, for example, Robinson [15] and Robinson and Karamuftuiglou [20].

One at least one occasion, Vickery used the term 'documentation' for something very similar:

Documentation is a practice concerned with all the processes involved in transferring documents from sources to users
[21, p 279]

While this might be taken to focus purely on the document, rather than its content, the needs and behaviour of the users, etc., the context of the quote suggests that

Vickery considered the documentation and information science disciplines to be essentially the same.

This leads to a consideration of what kind of discipline Vickery thought he was describing.

2 Information science as a field of study

Vickery was clear from an early stage that information science, both as an academic discipline and as a profession, was to be understood as a broad and diverse area.

The field of study is so wide and varied
[7, p 332]

This meant accepting a wide range of methods and tools in its development:

.. it is most important – particularly in an immature field like information science - to accept that all modes of study and all analytical methods can make useful contributions, and not to denigrate [qualitative] modes as 'just description'
[7, p 331]

and to avoid adherence to any particular paradigm or model [16].

Although he had clear views as to what were, for him, the most appropriate and interesting avenues, he was happy to live with other views:

Bertie Brookes and I shared a common view that, beyond the practical activities of information provision, there could be discerned a more general science of information. He tended towards a mathematical formulation of this: I was more interested in its social aspects.
[16, p 24-25]

Although Vickery does not acknowledge it, and no doubt was simply unaware, the kind of diverse subject area he was describing has been categorised theoretically by the philosopher Paul Hirst, as a 'field of study', aligned on a particular topic or subject, and studying it through the lens of any relevant forms of knowledge. Hirst distinguishes such fields from academic domains, based on a single form of knowledge, and practical disciplines, based on one of the forms. It has been suggested that information science is best viewed as a field of study, with the focus of recorded information [22]. This seems in accordance with Vickery's early delineation.

But within such a broad field, one might reasonably ask, where is its central focus, or core ?

3 The core of information science

Vickery seems to have been more concerned to emphasise the breadth and inclusivity of the information science discipline, rather than trying to identify its 'core'. In this, he differs from many commentators, who have been concerned to try to identify the essential core of the subject, typically for the purpose of drawing up an educational curriculum; see, for example, Cronin [23], Mezick and Koenig [24], Lørring [25], and Bawden [26].

Vickery alludes only on few occasions to this issue. In describing the conclusions of a conference in 1975 on the theoretical basis of information science, he writes, with apparent approval that:

Varied views were put forward as the content and priorities of information science, though there was general agreement that its central topics should be information organisation, dissemination and retrieval.

[16, p 25]

And, he more directly comments that:

Information science is concerned with every aspect of the chain of information transfer activities, but the heart of its interest is information search

[19, p 460]

'Search' may seem rather restrictive, but it is clear from some of his other writings [e.g. 7, 18] that this is intended to encompass all the aspects of knowledge organisation which facilitate search, as will be noted later. The delineation of these aspects of the subject as in some way central has been echoed in more recent analyses of European information curricula [27,28].

As well as the issue of its 'core', Vickery also gave consideration to the relations of information science with other disciplines.

4 Information science and other disciplines

His view of this was consistently positive, accepting the necessity for information science to accept inputs and insights from many other disciplines.

In seeking scientific understanding of the processes of information transfer we have had to go considerably outside the subject limits within which 'information science' as an academic subject is normally constrained.... It has become increasingly clear that only by widening its 'knowledge base' can information science establish a solid foundation for future development.
[5, p v]

The development of information research has increased considerably the interaction of emerging information science with other disciplines. Librarianship has traditionally had links with education and classification has drawn ideas from logic and philosophy. But during the last fifty years new insights and methods have been derived from sociology and social psychology, from computer science, from operations research and related quantitative approaches, from communications research, from linguistics, and most recently from the new hybrids: cognitive science and artificial intelligence.
[4, p 7]

The old-established groups in the information profession ... have come to recognise that many other social groups are concerned with information transfer.
[4, p 7]

All the elements of the process of 'becoming informed' ... are of interest to investigators other than 'information scientists'... The totality of activity related to information to information today is necessarily a multidisciplinary exercise.
[17, p xxiii]

Dillon [29] makes a similar point, arguing that "to study information .. is to study human behaviour in the context of data creation and use, where the data is abstracted into an examinable record [i.e. a document]". He points out the many disciplines and their different perspectives, including psychology, education and information systems, which have an interest in this, but argues that "such distinctions should not be firmly drawn: instead we should consider each of these (and the many other examples we could list) as manifestations of an underlying concern of [information] product with [information] process".

Within the concept of a multidisciplinary science, Vickery gave particular attentions to relations with a few closely related subject areas.

5 Cognate information disciplines: information technology, librarianship and communication studies

Of the subjects named in this section, Vickery was most interested in the interactions between information science and information technology or computer science.

Oppenheim [30, p53], reviewing Vickery's autobiographical monograph, comments that "Vickery is a great believer in studying how humans interact with information, rather than how computers store and retrieve it, and this sense of humanity comes through strongly".

This in no way implies that Vickery was a technophobe: rather than he believed that:

The principles of information science apply, whatever the medium of transfer.
[4, p 9]

and he wanted to focus on the personal and social consequences of technology, rather than technology *per se*.

*Information **systems**, at any level of complexity above that of speech, necessarily involve technologies such as printing, telecommunications, or computers. However, to information **science** technical potentialities and constraints are of importance mainly in that they affect the social relations concerned.*
[5, p 14]

while recognising that technology would lead directly to new developments for information science:

[Information] science and technology are now so closely linked that analysis and experiment lead quickly on to invention, to the introduction of new channels (and documents).
[17, p xxiii]

He referred in 1970 to the "new discipline of information science and technology" [31, p5], but on other occasions seems to have been clear that the two were distinct. Indeed in one of his later writings he expressed concerns about the result of a lack of such distinction:

Perhaps an underlying cause [of doubt as to the future of information science] is in some cases ... the apprehension that information science may become 'submerged' in the larger field of computer science
[17, p xxviii]

He wrote relatively little on the other cognate discipline which has caused much debate on its relations to information science; librarianship. He commented that

"Jason Faradane was .. very persistent in wishing to separate information work from conventional library work" [16, p13], with the apparent implication that he, Vickery, was not so bothered by this wish. Indeed, despite his lack of library qualifications, he seemed to move happily between the two disciplines, as practitioner, consultant and educator. Of his appointment as deputy librarian at the National Lending Library for Science and Technology, apparently to "bring the librarian's view to the enterprise" [32, p 43], he himself suggested that "despite my own lack of library education, I was regarded by the profession as "sound" [16, p 18]. Broughton [32] suggests that his change in interests during the 1960s, away from classification *per se* and towards a broader interest in information retrieval, reflects the developing split between librarianship and information science, but he, himself, never put it in that way.

Writing of the practice of documentation, which, as noted above, he seems to have viewed as little different from information science, he commented:

In the past, documentation has frequently been compared with librarianship, with some argument as to which comprehends the other. The field is more helpfully characterised if we take its scope to be all forms of document (i.e. any physical carrier of symbolic messages) and all aspects of their handling, from production to delivery. The document system then becomes very much wider than conventional librarianship – it includes publication and printing, distribution, some forms of telecommunication, analysis, storage, retrieval and delivery to the user.

[21, p 279]

To this extent, it seems that he viewed documentation/information science as the broader field; but he seems never to have had an interest in making a sharp distinction, as others did.

He did, however, think it worth drawing a clear distinction between information science as communication science / studies, perhaps in response to Ingwersen's point [8] that Vickery's original description of information science overlapped too much with mass communication studies:

*Mass communications analysts concentrate on 'who **sends** what information, for what purposes, through what channels, to which people, with what effect'. The information profession is more interested in 'who **seeks** what information, for what purposes, through what channels, from which people and sources, with what success'.*

[6, p 246]

While he espoused information science as an academic discipline, he saw a clear and necessary engagement with practice.

6 Information science: theory and practice

Vickery felt it necessary on several occasions to remind his readers that information science had come originally from the practical discipline of handling scientific information:

The term 'information science' first appeared in the guise of 'information scientist'/ Particularly in industry during recent decades, some qualified scientists moved out of research, development of production into a new occupational role, that of providing an active information service to their colleagues. They regarded themselves as 'information' scientists rather than 'research' scientists. As this kind of work expanded and became formalized the need was seen to provide training for those who would enter the occupation. In time, the content of this training came to be called 'information science'.

[5, pp 9 and 11]

and that the academic discipline was still sustained by its engagement with practice:

There does seem to be among some members of our profession a rather desperate search for a "fundamental theory of information", which leads them to attempt to derive our practice from disciplines such as epistemology, or hermeneutics, or discourse analysis, or semiotics, or even "cybersemiotics". Their derivations rarely make adequate contact with the realities of information practice ... The theory of a science should spring from deep immersion in its practice.

[16, p 29]

While he was by no means the only writer to emphasise the need for synergy between research and practice in the field (see Bawden [26] for other examples), he was among the strongest proponents of the issue.

He was happy to give a clear, if some might feel oversimplified, account of what practice amounted to, and how the academic discipline supported it:

Information practice ... consists of two activities that we may call diagnosis and prevention. Diagnosis is identifying what is the most probable information need of a user in a particular state of information want. Provision is deciding what action is most likely to meet that need. Information science seeks to understand the potential range of user situations giving rise to information want and needs; to develop methods of identifying the actual information needed; to understand and expand the range of possible ways of satisfying information need; and to develop methods of deciding what way is most likely to be effective in a particular case.

[17, p xxii-xxiii]

But he was far from happy about the way in which practice used research:

Looking back, I ask myself why so little of the basic research has had an impact on professional practice
[16, p 27]

He hypothesised that the problem might be because much information research was either so specialised in its nature as to be inapplicable to real problems, or alternatively produced findings of such generality that they were of little help [16]. But in truth, this is a very long-standing problem (see, for example, Blick [33], Bawden [26], and Hall [34]), not susceptible to simple answers.

Along with his views on research, Vickery had opinions on the related topic of professional education.

7 Education for information science

Largely self-taught in information matters, after a formal education in chemistry [16], he did not believe that others should follow his path, but rather that a education in information science was necessary:

.. for the profession as a whole, it is necessary that our hard-won understanding of our discipline be handed on to the next generation in a formal way.

[16, p 30]

He was also clear that this should be genuine education, and not vocational training:

Only in a very static profession can one be trained to slot in immediately to an available job, and our profession is far from static. It is more beneficial for the students to give them a generalised grounding in a wide variety of professional activities and concerns, so that they will have some background knowledge for no matter what job is first available. For those who seek it, our subject also has its cultural value, which can contribute to a general education.

[16, p 29]

As an antidote to the 'skills and competencies' mantra common in current higher education, this comes as something of a breath of fresh air. Vickery's ideas on the 'general' value of information education resonate with those who think of the subject, and related disciplines, as liberal arts [35, 36, 37], and his ideas have been used as the basis for the design of information courses at City University London [38]. It is perhaps regrettable that he did not write more on this topic.

Given Vickery's focus on the human side of information science, we should now consider the place of the user in his thought.

8 The importance of the user

Seemingly oddly, given his expressed emphasis on the human side of information science, only 2 of 10 chapters in his textbook [5] are devoted to personal or 'user' issues. This can be understood by appreciating his view that everything is about the user, and that no topic in information science should be discussed without explicit consideration of the human element:

User needs determine what functions should be provided, and different functions require different structures.

[39, p 74]

Structures and functions, and systems and interfaces, are not to be discussed in isolation. This seems to have been his touchstone for distinguishing information science from related areas, such as computer science and communications studies.

He took seriously the idea that information provision was potentially as important to the individual as healthcare, education, and other more 'recognised' needs:

Only relatively recently have we realised that serving people's information needs can be as socially valuable as looking after health and educational needs.

[16, p3]

He seems to have understood this 'recently' as meaning since the emergence of information science, emphasising the significance for him of the human factor in the subject. But he recognised that there was a historical dimension:

Perhaps the most important lesson that we can learn from information history is that information provision has been and must be closely related to information need, and that the information sources we provide must be close matched to the tasks being undertaken by the community served.

[6, p 246]

Yet Vickery's reputation is very much tied up with knowledge organisation, rather than with the more human aspects of the subject.

9 The place of knowledge organisation

Vickery's academic interests began with classification at their centre [1, 2, 3]. Later he developed a broader viewpoint, seeing knowledge organisation, in all its aspects including classification, as a part of the 'retrieval subsystem', which he in turn saw as the main focus of information science:

Information retrieval is now an accepted part of the new discipline of information science and technology .. I have concentrated on the field with which I am most familiar, the problems of bibliographic description and subject analysis

[31, p. v]

This is confirmed by his inclusion of knowledge organisation in the chapter on the retrieval subsystem in his information systems text [7], and by his inclusion of cataloguing, classification, indexing and abstracting, as well as searching and database design under the heading of information retrieval [18].

Furthermore, knowledge organisation tools, like the rest of the retrieval apparatus, are of only if they "can in each case pass a test of utility" [17, p xxvii]. And this utility, in Vickery's terms, must be assessed as usefulness to a real user with a real need; hence his caveats about the TREC style of system evaluation [17].

He saw knowledge organisation as one of the topics which linked information science to other disciplines:

The representation of knowledge in symbolic form is a matter that has pre-occupied the world of documentation since its origin. The problem is now relevant in many situations other than documents and indexes. The structure of records and files in databases: data structures in computer programming; the syntactic and semantic structure of natural language; knowledge representation in artificial intelligence; models of human memory: in all these fields it is necessary to decide how knowledge may be represented so that the representations may be manipulated.

[40, p. 145]

A prevailing theme of his later writings was the lack of appreciation by others of the value of information science's knowledge organisation tools, which he had done as much as anyone to develop:

The structural tools developed by the profession – hierarchical classifications, facets, thesaural relations, topical maps, the predicates used in ontology – will still be of use, provided that they can in each case pass a test of utility.

[17, p xxvii]

The analogy with bibliographic classifications and thesauri is obvious... despite the differences, it is to be regretted that 'ontological engineers' make

little or no reference to work in information science. As a consequence, they do not appear to draw at all on the rich experience of constructing knowledge schedules ... or .. developing concept lexicons
[41, p 284]

Perhaps this accounts to some extent for the negative tone of some of his later writing, as he looked to the future of information science [17].

10 Information science; looking backwards and forwards

Vickery himself had a long-standing interest in the history of his subject. He wrote on aspects of information history, for example the communication of science and scholarship in the Arab world in the medieval period, as internal reports while he was working in an industrial laboratory in the 1940s [42]; one wonders what his managers made of them. At a later date, he also taught library history to students at University College London [43]. Coates [3] emphasises his constant awareness of the historical dimension in his studies of classification, as is seen in his well-known textbook of the subject [44].

Although his main writings did not focus greatly on either history nor futurology, Vickery commented on occasions on both the past and future of the information disciplines, regretting that:

I suspect that teaching the history of our subject is less frequent in our institutions than it was. We are getting short-sighted both in looking forward and in looking backward, to our detriment.

[16, p 29]

He wrote enthusiastically about the need for a study of information history, believing that while solutions changed, problems never did:

I am always surprised that the information profession, so quick to sing the virtues of literature search for its customers, pays so little attention to its own history. I have been told: 'our problems are different from those of the past'. It is not so" the problems are often the same, only the technical means available for solution may be new. The thinking and experience of the past can often shed light on the present.

[45, p 144]

The problems of subject search on the Internet are no different in principle [from the printed index designs of the 1950s]

[16, p 11]

I am whole-heartedly in favour of the profession learning more about the history of [information transfer]. We have a tendency to focus on the newest forms of information provision ... neglecting the continued existence and continuing importance of all the previous forms... But our profession is not that of the historian (or sociologist or philosopher) interesting as their work may be.

[6, p 246]

He could not, in this last quote, resist telling his audience to stick to the information science last, and not try to be historians; typical of his pragmatic approach to the subject. Gilchrist [46], in his reflection on a early Vickery paper, gives examples of the way in which Vickery adapted existing knowledge organisation and retrieval

tools to the developing computer environment; this experience may well have been formative in his views of the value of lessons from history.

Looking to the future, he was, in his later writings somewhat subdued, detecting worries about the loss of identity of the field in the larger computing area [17]. However, the general tone of his writing is up-beat, more likely to chide the discipline for its timidity than to warn of its end. Quoting from the conclusions of a 1975 from a twenty year perspective, he commented:

"theoretical research in information science is still marked by a tendency to play safe'.. it is still marked by timidity. It could now afford to be more boldly speculative, intellectually exciting and therefore more attractive to intelligent basis of and ambitious students." Have things changed?
[16, p 25]

Perhaps he would wish to ask us the same today.

Conclusions

Vickery's writing touch on every aspect of the nature of information science as a discipline. For someone who abjured the search for fundamental principles, he has left us much to consider about the foundations of the subject.

He takes a pragmatic approach to understanding the concept of 'information' at the heart of the field, and seeks an equally pragmatic understanding of the purpose of the information science profession.

He insists that there must be a synergy between theory and practice in information science, and laments the lack of use of research by practice. He believes in the importance of theory, but not in the search for a single fundamental theory, paradigm or model. He sees formal education for the field as essential, provided it is broad-based and conceptual, and effectively a liberal art.

He sees information science as a broad field of study, with a unique interest in all aspects of information transfer, but with a particular focus on retrieval, and on the activities of knowledge organisation which make retrieval possible. He emphasises the human factor, but sees it as integral to all aspects of the subject, rather than an isolated segment. He prioritises knowledge organisation, with the caveat of its being subsumed to human needs, and laments the lack of appreciation by other disciplines for the value of these tools.

Vickery recognises that we must interact with, and learn from, other disciplines; he does not feel the need for a sharp demarcation from librarianship, but he worries that we will be enveloped by computer science, or that we will try to become historians or philosophers. He fully accepts the status of information science as a multidisciplinary field of study, with acceptance of a wide variety of perspectives and methods, and argues against a search for any one fundamental theory, model or paradigm.

He urges us to attend to the lessons of the past, and identify the things that do not change, and to be bold about the future.

Few, if any, of the founders of information science have left such a legacy of thoughts, to debate, and to stimulate the discipline for the future.

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